WEST Search History

DATE: Thursday, May 22, 2003

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT; PLUR=YES; OP=ADJ			
L8	l3 and transgenic	5	L8
L7	l2 and pseudomonas	2	L7
L6	l2 and phytophthora	1	L6
L5	l3 and salicylic	3	L5
L4	L3 and (wound or disease)	10	L4
L3	L2 and plant	80	L3
L2	wipk or wip	343	L2
L1	wipk or wound induc$ protein kinase	2	L1

END OF SEARCH HISTORY

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NEWS 4	Aug 08	PHARMAMarketLetter(PHARMAML) - new on STN
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NEWS 11	Oct 24	BEILSTEIN adds new search fields
NEWS 12	Oct 24	Nutraceuticals International (NUTRACEUT) now available on STN
NEWS 13	Nov 18	DKILIT has been renamed APOLLIT
NEWS 14	Nov 25	More calculated properties added to REGISTRY
NEWS 15	Dec 04	CSA files on STN
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NEWS 17	Dec 17	TOXCENTER enhanced with additional content
NEWS 18	Dec 17	Adis Clinical Trials Insight now available on STN
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NEWS 20	Feb 13	CANCERLIT is no longer being updated
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NEWS 24	Feb 26	NTIS now allows simultaneous left and right truncation
NEWS 25	Feb 26	PCTFULL now contains images
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NEWS 27	Mar 20	EVENTLINE will be removed from STN
NEWS 28	Mar 24	PATDPAFULL now available on STN
NEWS 29	Mar 24	Additional information for trade-named substances without structures available in REGISTRY
NEWS 30	Apr 11	Display formats in DGENE enhanced
NEWS 31	Apr 14	MEDLINE Reload
NEWS 32	Apr 17	Polymer searching in REGISTRY enhanced
NEWS 33	Apr 21	Indexing from 1947 to 1956 being added to records in CA/CAPLUS
NEWS 34	Apr 21	New current-awareness alert (SDI) frequency in WPIDS/WPINDEX/WPIX
NEWS 35	Apr 28	RDISCLOSURE now available on STN
NEWS 36	May 05	Pharmacokinetic information and systematic chemical names added to PHAR
NEWS 37	May 15	MEDLINE file segment of TOXCENTER reloaded
NEWS 38	May 15	Supporter information for ENCOMPPAT and ENCOMPLIT updated
NEWS 39	May 16	CHEMREACT will be removed from STN
NEWS 40	May 19	Simultaneous left and right truncation added to WSCA
NEWS 41	May 19	RAPRA enhanced with new search field, simultaneous left and right truncation

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               MACINTOSH VERSION IS V6.0b(ENG) AND V6.0Jb(JP),
               AND CURRENT DISCOVER FILE IS DATED 01 APRIL 2003
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=> s wipk or wound induc? protein kinase
L1          66 WIPK OR WOUND INDUC? PROTEIN KINASE

=> s l1 and plant?
L2          62 L1 AND PLANT?

=> s l2 and transgenic
L3          29 L2 AND TRANSGENIC

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4           15 DUP REM L3 (14 DUPLICATES REMOVED)

=> d 1-15 ti

L4   ANSWER 1 OF 15  CAPLUS  COPYRIGHT 2003 ACS        DUPLICATE 1
TI   Function of a mitogen-activated protein kinase pathway in N gene-mediated
     resistance in tobacco

L4   ANSWER 2 OF 15  AGRICOLA  Compiled and distributed by the National
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     of America.  It contains copyrighted materials.  All rights reserved.
     (2003)                                          DUPLICATE 2
TI   Double jeopardy: both overexpression and suppression of a redox-activated
     plant mitogen-activated protein kinase render tobacco
     plants ozone sensitive.
```

L4 ANSWER 3 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 3
TI Questioning the role of salicylic acid and cytosolic acidification in mitogen-activated protein kinase activation induced by cryptogein in tobacco cells.

L4 ANSWER 4 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 4
TI Promoter analysis of **WIPK**, a gene encoding a tobacco MAP kinase, with reference to wounding and tobacco mosaic virus infection

L4 ANSWER 5 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
TI Activation of salicylic acid-induced protein kinase, a mitogen-activated protein kinase, induces multiple defense responses in tobacco.

L4 ANSWER 6 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI Promoter analysis of **WIPK**: A tobacco wound induced MAP kinase.

L4 ANSWER 7 OF 15 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI Antisense expression of an Arabidopsis plastid omega-3 fatty acid desaturase gene enhances the necrotic lesion formation by TMV infection in **transgenic** tobacco **plants**.

L4 ANSWER 8 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 5
TI Differential induction of tobacco MAP kinases by the defense signals nitric oxide, salicylic acid, ethylene, and jasmonic acid

L4 ANSWER 9 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 6
TI A non-toxic pokeweed antiviral protein mutant inhibits pathogen infection via a novel salicylic acid-independent pathway

L4 ANSWER 10 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 7
TI Possible involvement of protein phosphorylation in the wound-responsive expression of Arabidopsis plastid .omega.-3 fatty acid desaturase gene

L4 ANSWER 11 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 8
TI Early signalling events in the Avr9/Cf-9-dependent **plant** defense response

L4 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2003 ACS
TI Pathogen-activatable MAP kinase **WIPK** to enhance disease resistance in **plants**

L4 ANSWER 13 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 9
TI Jasmonate-based wound signal transduction requires activation of **WIPK**, a tobacco mitogen-activated protein kinase.

L4 ANSWER 14 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 10
TI Rapid Avr9- and Cf-9-dependent activation of MAP kinases in tobacco cell cultures and leaves: convergence of resistance gene, elicitor, wound, and salicylate responses.

L4 ANSWER 15 OF 15 CAPLUS COPYRIGHT 2003 ACS
TI Cloning of cDNA for tobacco mitogen-activated protein (MAP) kinase that is

a possible mediator in wound signal transduction pathways

=> d ab

L4 ANSWER 1 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
AB The active defense of **plants** against pathogens often includes rapid and localized cell death known as hypersensitive response (HR). Protein phosphorylation and dephosphorylation are implicated in this event based on studies using protein kinase and phosphatase inhibitors. Recent transient gain-of-function studies demonstrated that the activation of salicylic acid-induced protein kinase (SIPK) and wounding-induced protein kinase (**WIPK**), two tobacco mitogen-activated protein kinases (MAPKs) by their upstream MAPK kinase (MAPKK), NtMEK2 leads to HR-like cell death. Here, we report that the conserved kinase interaction motif (KIM) in MAPKKs is required for NtMEK2 function. Mutation of the conserved basic amino acids in this motif, or the deletion of N-terminal 64 amino acids contg. this motif significantly compromised or abolished the ability of NtMEK2DD to activate SIPK/**WIPK** in vivo. These mutants were also defective in interacting with SIPK and **WIPK**, suggesting protein-protein interaction is required for the functional integrity of this MAPK cascade. To eliminate Agrobacterium that is known to activate a no. of defense responses in transient transformation expts., we generated permanent **transgenic plants**. Induction of NtMEK2DD expression by dexamethasone induced HR-like cell death in both T1 and T2 **plants**. In addn., by using PVX-induced gene silencing, we demonstrated that the suppression of all three known components in the NtMEK2-SIPK/**WIPK** pathway attenuated N gene-mediated TMV resistance. Together with previous report that SIPK and **WIPK** are activated by TMV in a gene-for-gene-dependent manner, we conclude that NtMEK2-SIPK/**WIPK** pathway plays a pos. role in N gene-mediated resistance, possibly through regulating HR cell death.

=> d au

L4 ANSWER 1 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
AU Jin, Hailing; Liu, Yidong; Yang, Kwang-Yeol; Kim, Cha Young; Baker, Barbara; Zhang, Shuqun

=> d so

L4 ANSWER 1 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
SO Plant Journal (2003), 33(4), 719-731
CODEN: PLJUED; ISSN: 0960-7412

=> d 2 ab

L4 ANSWER 2 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 2
AB In **plants**, the role of mitogen-activated protein kinase (MAPK) in reactive oxygen species (ROS)-based signal transduction processes is elusive. Despite the fact that ROS can induce MAPK activation, no direct genetic evidence has linked ROS-induced MAPK activation with the hypersensitive response, a form of programmed cell death. In tobacco, the major ROS-induced MAPK is salicylate-induced protein kinase (SIPK). We found through gain-of-function and loss-of-function approaches that both overexpression and RNA interference-based suppression of SIPK render the **plant** sensitive to ROS stress. **Transgenic** lines overexpressing a nonphosphorylatable version of SIPK were not ROS

sensitive. Analysis of the MAPK activation profiles in ROS-stressed **transgenic** and wild-type **plants** revealed a striking interplay between SIPK and another MAPK (**wound-induced protein kinase** [**WIPK**]) in the different kinotypes. During continuous ozone exposure, abnormally prolonged activation of SIPK was seen in the SIPK-overexpression genotype, without **WIPK** activation, whereas strong and stable activation of **WIPK** was observed in the SIPK-suppressed lines. Thus, one role of activated SIPK in tobacco cells upon ROS stimulation appears to be control of the inactivation of **WIPK**.

=> d 4 ab

L4 ANSWER 4 OF 15 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 4
AB **WIPK** (**wound induced protein kinase**) is a tobacco MAP kinase, transcripts of which are induced by mech. wounding and TMV infection. In order to clarify the mechanisms of regulation of **WIPK** expression, the authors isolated a 1122 bp section of the promoter region of the **WIPK** gene and fused it to the GUS reporter gene. Histochem. staining using a **transgenic** line contg. this construct clearly showed **WIPK** to be almost exclusively localized at or near the sites of wounding and necrotic lesions. To identify the responsive elements, 5'-deletion constructs contg. 874, 559 and 430 bp of the promoter regions, resp., were fused to GUS and **transgenic** tobacco lines contg. these constructs were assayed for GUS induction upon wounding or on stimulation of a hypersensitive response (HR) after TMV infection. Measurement of enzymic activity and Northern blot hybridization showed that the shortest promoter of 430 bp was sufficient for HR and a wound response, but that the extended region conferred a higher magnitude of response. It was thus suggested that, although the promoter region within 430 bp is essential, **WIPK** is regulated by multiple factors including enhancer-like elements residing beyond the core region.

=> d 12 ab

L4 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2003 ACS
AB Novel uses for **WIPK** , a member of the mitogen-activated protein (MAP) kinase family, are provided, based on the discovery that the **WIPK** protein is activatable in assocn. with development or enhancement of resistance to microbial pathogens. Tobacco mosaic virus infection activates a 44-kDa kinase designated **WIPK** in tobacco **plants** carrying the N resistance gene. In contrast to SIPK from tobacco and MAP kinases from yeast and mammals, activation of **WIPK** is preceded by a rise in mRNA levels and de novo synthesis of **WIPK** protein. Activation of **WIPK** is N resistance gene dependent, salicylic acid independent, and systemic. Wounding causes increased **WIPK** mRNA levels, but not increased **WIPK** protein levels. Thus, **WIPK** may play a crit. role in signal transduction for activation of **plant** defenses against certain microbial pathogens. Methods are disclosed for making **WIPK** **transgenic plants** with enhanced resistance to disease causing agents. In addn., **transgenic plants** transformed with **WIPK** and having enhanced disease resistance are disclosed.

=> d 12 pi

L4 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2003 ACS

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI WO 9943796 A1 19990902 WO 1999-US3882 19990223
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
AU 9927819 A1 19990915 AU 1999-27819 19990223

=> d 13 ab

L4 ANSWER 13 OF 15 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 9
AB A gene encoding a tobacco mitogen-activated protein kinase (**WIPK**) is transcriptionally activated in response to wounding. **Transgenic** tobacco **plants**, in which expression of endogenous **wipk** was suppressed, did not accumulate jasmonic acid or its methyl ester when wounded, suggesting that **WIPK** is involved in jasmonate-mediated wound signal transduction. Here, we demonstrate that activation of **WIPK** is required for triggering the jasmonate-mediated signal transduction cascade that occurs when wild-type tobacco **plants** are wounded. We also show that when **plants** are wounded, **WIPK** is rapidly and transiently activated, whereas the quantity of **WIPK** protein is maintained at a constant level. A **transgenic** tobacco **plant** in which the **wipk** gene was constitutively expressed at a high level showed constitutive enzymatic activation of **WIPK** and exhibited three- to fourfold higher levels of jasmonate than did its wild-type counterpart. This **plant** also showed constitutive accumulation of jasmonate-inducible proteinase inhibitor II transcripts. These results show that **WIPK** is activated in response to wounding, which subsequently causes an increase in jasmonate synthesis.

=> s wipk and sipk
L5 42 WIPK AND SIPK

=> s l5 and plant?
L6 39 L5 AND PLANT?

=> dup rem l6
PROCESSING COMPLETED FOR L6
L7 20 DUP REM L6 (19 DUPLICATES REMOVED)

=> d 1-10 ti

L7 ANSWER 1 OF 20 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
TI Function of a mitogen-activated protein kinase pathway in N gene-mediated resistance in tobacco

L7 ANSWER 2 OF 20 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI Interaction between two mitogen-activated protein kinases during tobacco defense signaling.

L7 ANSWER 3 OF 20 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 2

TI Double jeopardy: both overexpression and suppression of a redox-activated **plant** mitogen-activated protein kinase render tobacco **plants** ozone sensitive.

L7 ANSWER 4 OF 20 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 3
TI Questioning the role of salicylic acid and cytosolic acidification in mitogen-activated protein kinase activation induced by cryptogein in tobacco cells.

L7 ANSWER 5 OF 20 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI A 45-kDa protein kinase related to mitogen-activated protein kinase is activated in tobacco cells treated with a phorbol ester.

L7 ANSWER 6 OF 20 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 4
TI MAP kinase cascades in elicitor signal transduction

L7 ANSWER 7 OF 20 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 5
TI Activation of salicylic acid-induced protein kinase, a mitogen-activated protein kinase, induces multiple defense responses in tobacco.

L7 ANSWER 8 OF 20 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003) DUPLICATE 6
TI Activation of a mitogen-activated protein kinase pathway is involved in disease resistance in tobacco.

L7 ANSWER 9 OF 20 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
TI MAPK activation induced by cryptogein, an elicitor of tobacco defense responses.

L7 ANSWER 10 OF 20 CAPLUS COPYRIGHT 2003 ACS
TI Molecular cloning and cultivar specific expression of MAP kinases from Capsicum annuum

=> d so

L7 ANSWER 1 OF 20 CAPLUS COPYRIGHT 2003 ACS DUPLICATE 1
SO Plant Journal (2003), 33(4), 719-731
CODEN: PLJUED; ISSN: 0960-7412

=> d 2 so

L7 ANSWER 2 OF 20 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
SO Plant Journal, (April 2003, 2003) Vol. 34, No. 2, pp. 149-160. print.
ISSN: 0960-7412.

=> d 2 ab

L7 ANSWER 2 OF 20 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC.
AB **Plant** mitogen-activated protein kinases (MAPKs) represented by tobacco wounding-induced protein kinase (**WIPK**) have unique regulation at the level of transcription in response to stresses. By using transcriptional and translational inhibitors, it has been shown previously that **WIPK** gene expression and de novo protein synthesis are

required for the high-level activity of **WIPK** in cells treated with elicitins from Phytophthora spp. However, regulation of **WIPK** expression and the role(s) of **WIPK** in **plant** disease resistance are unknown. In this report, we demonstrate that **WIPK** gene transcription is regulated by phosphorylation and de-phosphorylation events. Interestingly, salicylic acid-induced protein kinase (**SIPK**) was identified as the kinase involved in regulating **WIPK** gene expression based on both gain-of-function and loss-of-function analyses. This finding revealed an additional level of interaction between **SIPK** and **WIPK**, which share an upstream MAPKK, NtMEK2. Depending on whether **WIPK** shares its downstream targets with **SIPK**, it could either function as a positive feed-forward regulator of **SIPK** or initiate a new pathway. Consistent with the first scenario, co-expression of **WIPK** with the active mutant of NtMEK2 leads to accelerated hypersensitive response (HR)-like cell death in which **SIPK** also plays a role. Mutagenesis analysis revealed that the conserved common docking domain in **WIPK** is required for its function. Together with prior reports that (i) **WIPK** is activated in NN tobacco infected with tobacco mosaic virus, and (ii) PVX virus-induced gene silencing of **WIPK** attenuated N gene-mediated resistance, we concluded that **WIPK** plays a positive role in **plant** disease resistance, possibly through accelerating the pathogen-induced HR cell death.

=> d 4 ab

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AB Elicitors of **plant** defence reactions, oligogalacturonides and cryptogein, an elicitin produced by Phytophthora cryptogea, were previously shown to induce a rapid and transient activation of two mitogen-activated protein kinases (MAPKs) in cells of tobacco [Nicotiana tabacum L. cv. Xanthi; A. Lebrun-Garcia et al. (1998) **Plant** J 15:773-781]. We verified that these two MAPKs correspond to the salicylic acid-induced protein kinase (**SIPK**) and the wound-induced protein kinase (**WIPK**). The involvement of salicylic acid (SA) in cryptogein-induced MAPK activation was investigated using transgenic NahG tobacco cells expressing the salicylate hydroxylase gene and thus unable to accumulate SA. The large and sustained activation of both MAPKs by cryptogein was maintained in transgenic cells compared with non-transgenic tobacco cells. Moreover, weak acids, namely SA, 4-hydroxybenzoic acid, an ineffective analogue of SA in **plant** resistance, and butyric acid acidified the cytosol, a physiological event also induced by cryptogein, but activated both MAPKs only slightly and transiently in tobacco cells. These results indicate that MAPK activation by cryptogein is not mediated by SA, that cytosolic acidification can be transduced by MAPKs, and that in cryptogein-treated cells, cytosolic acidification should contribute poorly to MAPK activation.

=> d 4 so

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SO Planta, Mar 2002. Vol. 214, No. 5. p. 792-797
Publisher: Berlin ; New York : Springer-Verlag, 1925-
CODEN: PLANAB; ISSN: 0032-0935

=> s l7 and transgenic
L8 8 L7 AND TRANSGENIC

=> d 1-8 ti

L8 ANSWER 1 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
TI Double jeopardy: both overexpression and suppression of a redox-activated **plant** mitogen-activated protein kinase render tobacco **plants** ozone sensitive.

L8 ANSWER 2 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
TI Questioning the role of salicylic acid and cytosolic acidification in mitogen-activated protein kinase activation induced by cryptogein in tobacco cells.

L8 ANSWER 3 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
TI Activation of salicylic acid-induced protein kinase, a mitogen-activated protein kinase, induces multiple defense responses in tobacco.

L8 ANSWER 4 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
TI Rapid Avr9- and Cf-9-dependent activation of MAP kinases in tobacco cell cultures and leaves: convergence of resistance gene, elicitor, wound, and salicylate responses.

L8 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2003 ACS
TI Function of a mitogen-activated protein kinase pathway in N gene-mediated resistance in tobacco

L8 ANSWER 6 OF 8 CAPLUS COPYRIGHT 2003 ACS
TI Early signalling events in the Avr9/Cf-9-dependent **plant** defense response

L8 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2003 ACS
TI Differential induction of tobacco MAP kinases by the defense signals nitric oxide, salicylic acid, ethylene, and jasmonic acid

L8 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2003 ACS
TI Pathogen-activatable MAP kinase **WIPK** to enhance disease resistance in **plants**

=> d 5 ab

L8 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2003 ACS
AB The active defense of **plants** against pathogens often includes rapid and localized cell death known as hypersensitive response (HR). Protein phosphorylation and dephosphorylation are implicated in this event based on studies using protein kinase and phosphatase inhibitors. Recent transient gain-of-function studies demonstrated that the activation of salicylic acid-induced protein kinase (**SIPK**) and wounding-induced protein kinase (**WIPK**), two tobacco mitogen-activated protein kinases (MAPKs) by their upstream MAPK kinase

(MAPKK), NtMEK2 leads to HR-like cell death. Here, we report that the conserved kinase interaction motif (KIM) in MAPKKs is required for NtMEK2 function. Mutation of the conserved basic amino acids in this motif, or the deletion of N-terminal 64 amino acids contg. this motif significantly compromised or abolished the ability of NtMEK2DD to activate **SIPK** /**WIPK** in vivo. These mutants were also defective in interacting with **SIPK** and **WIPK**, suggesting protein-protein interaction is required for the functional integrity of this MAPK cascade. To eliminate Agrobacterium that is known to activate a no. of defense responses in transient transformation expts., we generated permanent **transgenic plants**. Induction of NtMEK2DD expression by dexamethasone induced HR-like cell death in both T1 and T2 **plants** . In addn., by using PVX-induced gene silencing, we demonstrated that the suppression of all three known components in the NtMEK2-**SIPK**/ **WIPK** pathway attenuated N gene-mediated TMV resistance. Together with previous report that **SIPK** and **WIPK** are activated by TMV in a gene-for-gene-dependent manner, we conclude that NtMEK2-**SIPK/WIPK** pathway plays a pos. role in N gene-mediated resistance, possibly through regulating HR cell death.

=> d 5 so

L8 ANSWER 5 OF 8 CAPLUS COPYRIGHT 2003 ACS
SO Plant Journal (2003), 33(4), 719-731
CODEN: PLJUED; ISSN: 0960-7412

=> d 3 ab

L8 ANSWER 3 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
AB The activation of mitogen-activated protein kinases (MAPKs) is one of the earliest responses in **plants** challenged by avirulent pathogens or cells treated with pathogen-derived elicitors. Expression of a constitutively active MAPK kinase, NtMEK2DD, in tobacco induces the expression of defense genes and hypersensitive response-like cell death, which are preceded by the activation of two endogenous MAPKs, salicylic acid-induced protein kinase (**SIPK**) and wounding-induced protein kinase (**WIPK**). However, the roles that **SIPK** and **WIPK** each play in the process are unknown. Here we report that **SIPK** alone is sufficient to activate these defense responses. In tobacco leaves transiently transformed with **SIPK** under the control of a steroid-inducible promoter, the induction of **SIPK** expression after the application of dexamethasone, a steroid, leads to an increase of **SIPK** activity. The increase of **SIPK** activity is dependent on the phosphorylation of newly synthesized **SIPK** by its endogenous upstream kinase. In contrast, the expression of **WIPK** under the same conditions fails to increase its activity, even though the protein accumulates to a similar level. Studies using chimeras of **SIPK** and **WIPK** demonstrated that the C terminus of **SIPK** contains the molecular determinant for its activation, which is rather surprising because the N termini of **SIPK** and **WIPK** are more divergent. **SIPK** has been implicated previously in the regulation of both **plant** defense gene activation and hypersensitive response-like cell death based on evidence from pharmacological studies using kinase inhibitors. This gain-of-function study provided more direct evidence for its role in the signaling of multiple defense responses in tobacco.

=> d 3 so

L8 ANSWER 3 OF 8 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2003)
SO The Plant cell, Aug 2001. Vol. 13, No. 8. p. 1877-1889
Publisher: [Rockville, MD : American Society of Plant Physiologists, c1989-
CODEN: PLCEEW; ISSN: 1040-4651

=> d 8 so

L8 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2003 ACS
SO PCT Int. Appl., 56 pp.
CODEN: PIXXD2

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PI WO 9943796	A1	19990902	WO 1999-US3882	19990223
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